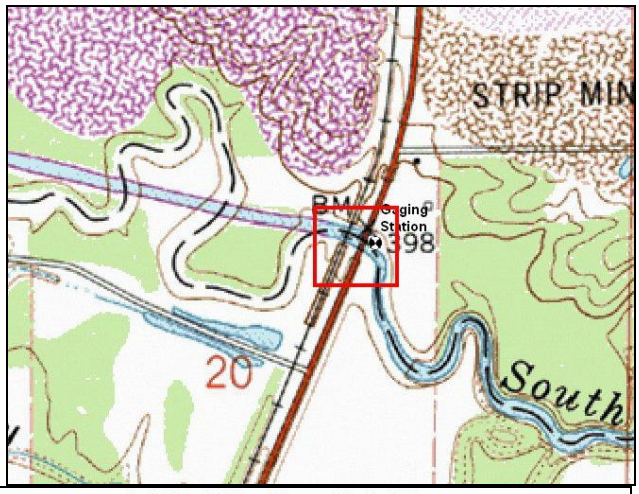
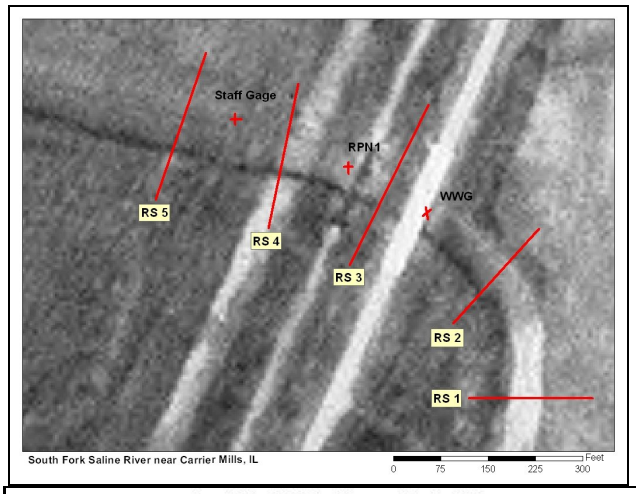
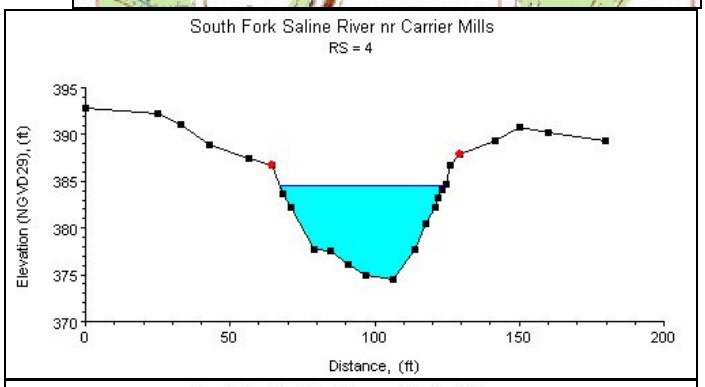
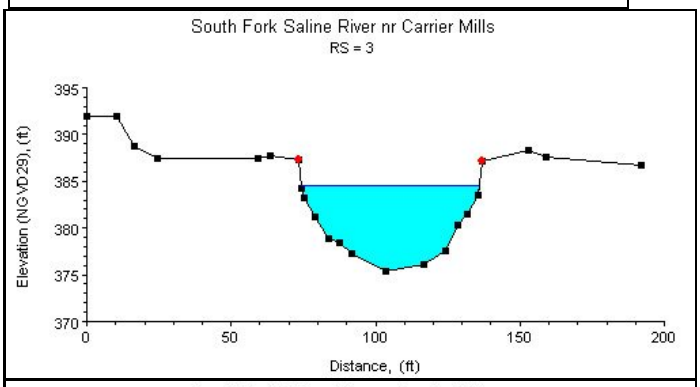
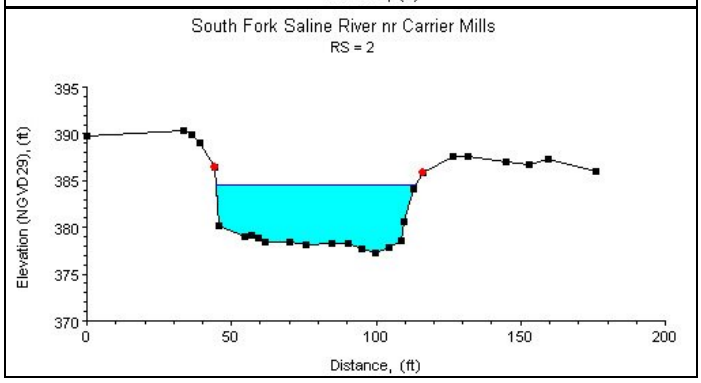
South Fork Saline River near Carrier Mills, IL

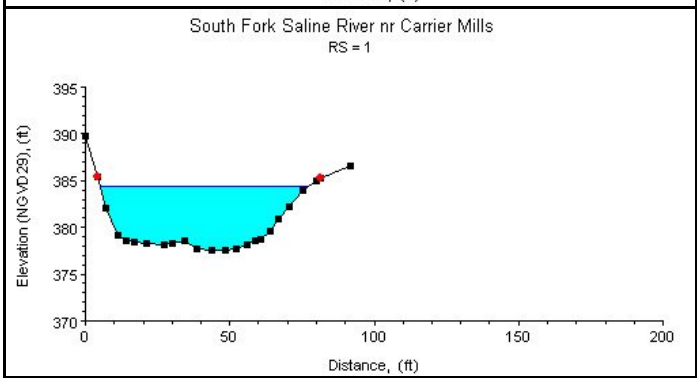












Study Reach.--The channel reach under consideration is a dredged channel with heavy vegetation coverage. The study reach selected, approximately 750 ft long, is located from 400 ft upstream of the USGS streamgage-station to 350 ft downstream of the station. The study reach represents a transition from a straightened dredged channel to a natural meandering channel segment downstream, as shown in the quadrangle map on the top left. Five surveyed cross sections (surveyed by the U.S. Geological Survey in April 2003) are available for evaluating channel geometries of the study reach. The channel alignment and approximate variations in channel width and bank conditions are shown in the aerial photo on the top right. Cross-sectional geometries vary gradually and continuously from upstream to downstream (see plots above).

Gage Location.--Lat 37°38'16", long 88°40'40", in SW1/4 NE1/4 sec.20, T.10S., R.5E., hydrologic unit 05140204, on right bank at downstream side of bridge on U. S. Route 45, 150 ft downstream from railroad bridge, 4.5 mi southwest of

Carrier Mills, Saline County and at river mi 42.4. The USGS streamgage-station number is 03382100.

Drainage Area.--147 sq mi.

Gage Datum and Elevations of Reference Points.--Datum of gage is 375.63 ft. A staff gage is set up at about 350 ft upstream from the gage, elevation of brass screw = 382.807 ft. Reference point for n-values study RP-N1 is two file marks on the steel plate of the 13th vertical from the left on the guardrail, at midchannel on the upstream side of the bike-path trestle, elevation = 407.882 ft. There is a wire-weight gage (WWG) attached to the downstream side of the U.S. Route 45 bridge. All elevations are in NGVD 1929 convention.

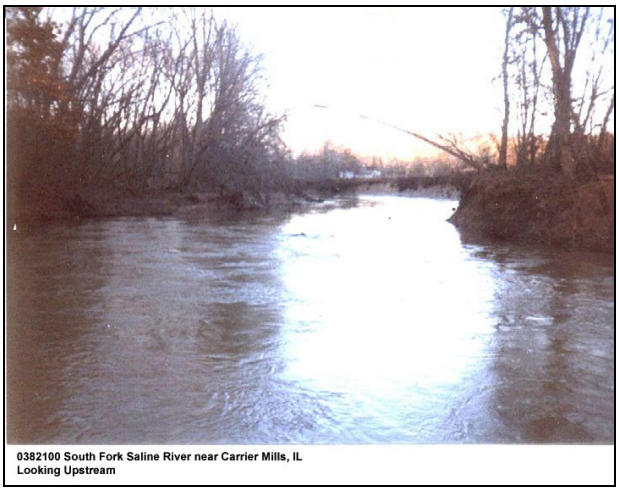
Stage, Discharge Measurements, and Computed n-Values.--Water-surface elevations were measured at the staff gage, RP-N1 and WWG before and after each discharge measurement. Discharge measurements were made using the conventional current-meter method. The computed n-values are listed in the following table. Whenever possible, the computed n-values are associated with a photo taken at the time of the measurement. The photos are arranged from low stage to high stage in order to illustrate contributing factors of n-values at a particular stage.

Date of Observation	Discharge (ft^3/s)	Average Cross Section Area (ft^2)	Hydraulic Radius (ft)	Mean Velocity (ft/s)	Slope	Coefficient of Roughness *n*
5/8/2003	742.0	380.1	5.05	2.18	0.000354	0.029
11/2/2004	1290.0	571.1	6.70	2.46	0.000562	0.042
5/5/2003	1450.0	584.8	6.85	2.70	0.000425	0.034

03382100 South Fork Saline River near Carrier Mills, IL 12/03/03
Low flow, looking Downstream from bridge

03382100 South Fork Saline River near Carrier Mills, IL 12/03/03
Low flow, looking Upstream from bridge

03382100 South Fork Saline River near Carrier Mills, IL
Looking Downstream



0382100 South Fork Saline River near Carrier Mills, IL
Looking Upstream

Description of Channel.--This channel is natural with a 90° bend. The bend represents a transition from a straightened dredged channel to a natural meandering channel. The bed materials consist of hard clay and shale overlain in spots with fine sediments from strip mining upstream. Channel geometry is generally trapezoidal with bed encroachment showing at upstream portion of the study reach. The bottom width of the channel widens from about 40 ft upstream to as much as 60 ft downstream. The left-bank height is about 14 ft and right bank height is approximately 10 ft before any overflow to the flood plains occurs. Top width of the channel ranges from about 50 ft to nearly 70 ft. Bank faces are covered with grasses and exposed tree roots. The top of the right bank is wooded and brushy along the channel, with grass in the flood plains. The left flood plain is a cultivated field. Bank slope is steep and both banks are eroded up to the tree line.

Floods.--Jan. 31, 1982, 5160 ft^3/s, (gage height 16.32 ft).

Estimated n-Values using Cowan s Approach.--0.027 - 0.038